Appendix F
USACE Design Criteria

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(Revised July 8, 2005)

Plate #	Resource	Location (Station #)	USACE Design Comment
General			All SWM sites should have a 25' buffer from the toe of berm to any WUS delineation. Areas between the berm and the WUS should be planted. Temporary diversions, outfalls and stream channel within existing and proposed right-of-way, as well as perpetual easement, should be stabilized as warranted.
27	Moores Run Park and Moores Run 100-year floodplain	I-895 northbound and southbound	The bridge over Moores Run will be reconstructed. It will have a longer span to stay out of the 100-year floodplain and Moores Run Park. The USACE had no design criteria for this area because there would not be any impacts to stream and/or wetlands.
28	Moores Run (HRMR-WUS 1)	Sta. 98 to 102 (right and left)	The USACE agreed the use of culvert extensions for this crossing.
29	Moores Run Park	Sta. 131 to 135 (left)	A retaining wall is being used in this area to avoid impacting the park. The USACE had no design criteria for this area because there would not be any impacts to stream and/or wetlands.
29	HRMR-WUS2 HRMR-WET6 HRMR1-WET4	Sta. 136 to 140 (left)	A retaining wall is only necessary to avoid 4 (f) impacts to Moores Run and Garden Village Parks. Wetland impacts will be minimized by culvert extension and use of 2:1 embankment at this location.
29	62nd Avenue	Sta. 119 to 134 (right)	The retaining wall is needed to avoid impacting 62nd Avenue. The USACE had no design criteria for this area because there would not be any impacts to stream and/or wetlands.
30	Stream and Garden Village Park	Sta. 145 to 150 (left)	The USACE agreed the use of culvert extensions for this crossing. A retaining wall is not needed in this area specifically to avoid impacts to the stream.
31	HRRC-WUS3 and HRRC-WUS2	Sta. 175 to 182 (right)	The retaining wall is necessary specifically to resolve grade differences. The stream may be piped from the 36" culvert to Sta. 178+50 provided an energy dissipater is constructed at the new pipe outfall. The grade outside of the wall may be raised to lessen impacts to Level-3 and the 72 inch water line.
32	Redhouse Creek (HRRC-WUS1) and HRRC-WET5	Sta. 203 to 210 (right)	The USACE has made it a permit condition that a retaining wall be used in this location to avoid impacts to HRRC-WUS1. However, the wall may be moved up to 12 feet outside the currently proposed location to accommodate future widening beyond the design year. If meeting this objective results in less than 10 feet of buffer between the proposed wall and the stream bank, additional consultation shall be undertaken with the Corps Design of wall should easily accommodate future extension in height.
32	Redhouse Creek (HRRC-WUS1) and HRRC-WUS6	Sta. 207 to 214 (left)	The USACE has agreed to removing the retaining wall between Sta. 206+50 and 210+50 and piping HRRC-WUS6. The USACE has made it a permit condition that a retaining wall be used between Sta. 210+50 and 215+00 left to minimize impacts to HRRC-WUS1.
33	HRRC-WUS9B	Sta. 232 to 234 (left)	The USACE will allow the stream to be piped from Sta. 232+40 Lt. to the existing 54" pipe outlet, provided an energy dissipater is constructed at the new pipe outfall.
33	SRSR-WUS16	Sta. 249 (left)	The USACE indicated that a culvert extension could be used at the stream crossing. A retaining wall is not feasible.
33 and 34	Community	Sta. 254 to 262 (right)	The retaining wall in this location is used to avoid impacting the Willow Hill community. The USACE had no design criteria for this area because there would not be any impacts to stream and/or

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			wetlands.
34	Stemmers Run (SRSR-WUS 45)	I-695 eastbound Sta. 1711 to 1716	The USACE believes that the Linover Park mitigation site will have the most effective environmental benefit if mitigation takes place in Linover Park, on SHA property and on a parcel of private property. The Authority will continue to coordinate with the Baltimore County Department of Recreation & Parks, SHA and the private landowner, and acquire whatever land is necessary for this mitigation site.
36	SRSR-WUS20, SRSR-WET21, and SRSR-WET19	I-695 eastbound Sta. 1740 to 1743	Wetland impacts will be minimized by culvert extension and use of 2:1 embankment at this location.
37	East Avenue	Sta. 260 to 264 (left)	The retaining wall in this location is used to avoid impacting the East Avenue. The USACE had no design criteria for this area because there would not be any impacts to stream and/or wetlands.
37	SRSR-WUS22	Ramp GB Sta. 200 to 201 (right)	The stream may be relocated for placement of retaining wall as feasible.
38	Wetland and streams	I-95/I-695 interchange	The design of the I-95/I-695 interchange is constantly being altered. Therefore, it is difficult to determine what type of minimization and avoidance measures can be used during the planning phase. The USACE has requested a review of the final design of the I-95/I-695 interchange. They will issue their design criteria at that time. The Authority will provide a copy of the 30% design plans for this mitigation site to the USACE.
38	SRSR-WET3 and SRSR-WUS14	Ramp ME Sta. 1346 to 1350 (right and left)	Wetland impacts will be minimized by culvert extension and use of 2:1 embankment at this location.
	SRSR-WUS13	I-695 WB Sta. 1928	Wetland impacts will be minimized by culvert extension and use of 2:1 embankment at this location.
40	SRSR-WUS12	Sta. 293 to 301 (right)	Wetland impacts will be minimized by culvert extension and use of 2:1 embankment at this location.
41	WMSF-WUS1 and WMSF-WUS6	Sta. 317 (left and right)	The retaining walls at this location are not feasible. Culvert extensions are a more feasible option at this location.
41	WMSF-WUS9	Sta. 326 (right)	No retaining wall is necessary in this location. A culvert extension is the feasible option.
41	WMSF-WUS12	Sta. 329 (left)	Relocation of the stream along the proposed ditchline and extend the culvert is acceptable.
41 and 42	Nottingham Park	Sta. 341 to 352+50 (right)	Retaining wall is needed to avoid impacts to Nottingham Park.
42	WMMS-WUS1, WMMS-WUS2, and WMMS-WUS12	Sta. 357+50 to 365+50 (left)	Filling WMMS-WUS1 and WMMS-WUS2 and extending the culvert for WMMS-WUS12 is the most feasible option for this location.
42	WMMS-WUS22 and WMSF-WET 4	Sta. 365 (right)	Wetland impacts will be minimized by culvert extension and use of 2:1 embankment at this location If feasible, shorten ditches to outfall into wetlands at Sta. 360 Rt. and Sta. 365+50.
43	WMSF-WUS28	Sta. 386 (right)	The most feasible option is to use a culvert extension at this location.
44	WMMS-WET14	Sta. 413 to 423+50 (left)	A retaining wall is not the most feasible option for this wetland. This wetland collects a significant amount of stormwater. The Authority can look at various options in attempting to save some of the SWM capacity of this wetland.
46	WMMS-WET4	Ramp G Sta. 609+50 to 611 (left)	The USACE recommends eliminating the proposed ditch that runs through WMMS-WET4. Evaluate terminating the ditch in the wetland so the ditch does not drain the wetland.

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48	WMHG-WET3, WMHG-WUS4, WMHG-WUS3, WMHG-WUS2, and WMHG-WUS11	Sta. 478 to 485 (right and left)	A retaining wall located at the existing headwall on each side was discussed. The USACE would allow placement of a wall up to 12 feet outside of the existing headwall to accommodate future widening beyond the design year. Design of wall should easily accommodate future extension in height. Wetland boundary from Sta. 483 Lt. to 484+70 appears to be inconsistent with the existing contours and will be verified by the USACE.
49	BRBR-WUS8, BRBR-WUS7, and BRBR-WUS4	Sta. 513 to 524 (right)	The current design submitted with the FONSI is acceptable for this location provided 25-foot vegetated buffers are left between the toe of berm for the SWM pond and the stream bank.
50	BRBR-WUS1 and BRBR-WUS2	Sta. 528+50 to 533 (right)	The interior ditch is utilized as a grass swale for water quality. The exterior ditch is utilized as a Clearwater diversion to maximize the efficiency of the grass swale. Relocation of the existing V-shaped channel to the Clearwater diversion ditch is acceptable. If a wall is needed, the USACE would allow a wall that accommodates an additional 12 feet of pavement over what is currently reflected for future widening beyond the design year. Design of such wall should easily accommodate future extension in height
51	BRBR-WET1, GPJR-WUS2, GPJR-WUS3, and GPJR-WUS10	Sta. 552 to 565 (right)	Place orange plastic fence 5' outside of top of cut for ditch at Sat. 564+25 Rt. to limit disturbance of wetland. Show LOD that is consistent with water quality swale and diversion ditch from Sta. 559 to beyond Sta. 565, as they appear to reflect SWM sites that were abandoned earlier in the planning process. During design, explore whether it is feasible to terminate the proposed roadside ditch at wetland BRBR-WET 1 (Sta. 555 Rt) so that the ditch does not drain the wetland.